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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/588,260	YOKOYAMA ET AL.	
	Examiner	Art Unit	
	Derek J. Rosenau	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16-26 and 31-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16,18-26,31 and 34-39* is/are rejected.

7)☒ Claim(s) *17,32 and 33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 22 and 37 are objected to because of the following informalities: it appears that "a thin plate comprising a substance selected from a group consisting of carbon; gold; platinum; nickel; titanium; stainless steel; an alloy of gold; an alloy of platinum; an alloy of nickel; an alloy of titanium; and an alloy of stainless steel" should be "a thin plate comprising a substance selected from a group consisting of carbon, gold, platinum, nickel, titanium, stainless steel, an alloy of gold, an alloy of platinum, an alloy of nickel, an alloy of titanium, and an alloy of stainless steel" where the list of materials are separated by commas instead of semicolons. Appropriate correction is required.

2. Claim 16 is objected to because of the following informalities: it appears that "each of at least on band-like portion" should be "each of at least one band-like portion". Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 22 and 37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear whether applicant intends to claim that the first electrode is a thin plate having been subjected to a surface treatment or if applicant intends to claim that the first electrode is a thin plate comprising a substance

selected from a group consisting of carbon, gold, platinum, nickel, titanium, stainless steel, an alloy of gold, an alloy of platinum, an alloy of nickel, an alloy of titanium, and an alloy of stainless steel.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 16, 18, 21-23, 25, 26, 31, and 34-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keiichi et al. (JP 11-169394) in view of either Wilkie et al. (US 6629341) or Spangler et al. (US 2005/0200243).

7. With respect to claim 16, Keiichi et al. discloses a flat-plate low-profile actuator (Fig 1), comprising: a planar conductive polymer layer extending in a longitudinal direction (item 3b); a first electrode (item 5b) in contact with the planar conductive polymer layer; a second electrode (item 5a) disposed opposite to the first electrode; and an electrolyte layer (item 2) in contact with the planar conductive polymer layer, disposed in between the first electrode and the second electrode (Fig 1), wherein the first electrode is planar (Fig 1), and wherein application of an electric potential between the first electrode and the second electrode deforms the planar conductive polymer layer such that the flat-plate low-profile actuator expands or contracts in the longitudinal direction (Paragraph 5).

Keiichi et al. does not disclose expressly that the first electrode comprises at least one band-like portion and at least one link portion, each of the at least one link portion extending in the longitudinal direction, each of the at least one band-like portion extending in a direction perpendicular to the longitudinal direction, and each of the at least one link portion is shorter than each of the at least one band-like portion.

Spangler et al. teaches a flat-plate low-profile actuator in which the first electrode (Fig 6) comprises at least one band-like portion (portions extending horizontally across the actuator) and at least one link portion (portions extending longitudinally across the actuator), each of the at least one link portion extending in the longitudinal direction, each of the at least one band-like portion extending in a direction perpendicular to the longitudinal direction, and each of the at least one link portion is shorter than each of the at least one band-like portion (Fig 6)

Wilkie et al. teaches a flat-plate low-profile actuator in which the first electrode (item 30 or 32) comprises at least one band-like portion (item 36 or 40) and at least one link portion (item 34 or 38), each of the at least one link portion extending in the longitudinal direction (Fig 4), each of the at least one band-like portion extending in a direction perpendicular to the longitudinal direction (Fig 4), and each of the at least one link portion is shorter than each of the at least one band-like portion (Fig 4).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the first electrode of either Spangler et al. or Wilkie et al. with the flat-plate low-profile actuator of Keiichi et al. for the benefit of ensuring proper

connection despite the occurrence of cracks (Paragraph 61 of Spangler et al.) or of permitting large in-plane actuation strains (column 1, lines 28-30 of Wilkie et al.).

8. With respect to claim 18, the combination of Keichi et al. and either Spangler et al. or Wilkie et al. discloses the flat-plate low-profile actuator as claimed in claim 16. Both Spangler et al. and Wilkie et al. disclose that the first electrode is a planar electrode (Fig 6 of Spangler et al. or Fig 4 of Wilkie et al.), the at least one band-like portion is a plurality of band-like portions (Fig 6 of Spangler et al. or Fig 4 of Wilkie et al.), the at least one link portion is a plurality of link portions (Fig 6 of Spangler et al. or Fig 4 of Wilkie et al.), and the plurality of link portions connect adjacent pairs of the band-like portions (Fig 6 of Spangler et al. or Fig 4 of Wilkie et al.).

9. With respect to claim 21, the combination of Keichi et al. and either Spangler et al. or Wilkie et al. discloses the flat-plate low-profile actuator as claimed in claim 16. Keiichi et al. discloses that the first electrode and the second electrode are disposed on alternate sides of the plat-plate low-profile actuator (Fig 1).

10. With respect to claim 22, the combination of Keichi et al. and either Spangler et al. or Wilkie et al. discloses the flat-plate low-profile actuator as claimed in claim 16. Keichi discloses that the first electrode is a thin plate (Fig 1). The language "having been subjected to a surface treatment" is product-by-process language that does not, by itself, provide additional structure. It has been held that if the claimed product is the same as or obvious over a product of the prior art, the claim is unpatentable even if the product of the prior art is made by a different process (*In re Thorpe*, 227 USPQ 964). Keichi et al. also discloses that the first electrode is a thin plate comprising a substance

selected from a group consisting of carbon, gold, platinum, nickel, titanium, stainless steel, an alloy of gold, an alloy of platinum, an alloy of nickel, an alloy of titanium, and an alloy of stainless steel (Paragraph 26).

11. With respect to claim 23, the combination of Keichi et al. and either Spangler et al. or Wilkie et al. discloses the flat-plate low-profile actuator as claimed in claim 16. Keiichi et al. discloses that the planar conductive polymer layer is composed of a pi-conjugated polymer layer with a substrate comprising a substance selected from a group consisting of ploy aniline, polypyrrole, polythiophene, a carbon dispersion conductive polymer, and an organic conductive polymer which is a derivative of polyaniline, polypyrrole, or polythiophene (Paragraph 14).

12. With respect to claim 25, the combination of Keichi et al. and either Spangler et al. or Wilkie et al. discloses the flat-plate low-profile actuator as claimed in claim 16. Keiichi et al. discloses that a ratio of a thickness of the planar conductive polymer layer to a thickness of the first electrode is not more than 3 (Fig 1).

13. With respect to claim 26, Keiichi et al. discloses a flat-plate low-profile actuator (Fig 1), comprising: a planar conductive polymer layer extending in a longitudinal direction (item 3b); a first electrode ((item 5b) in contact with the planar conductive polymer layer; a second electrode (item 5a) opposite to the first electrode; and an electrolyte layer (item 2) in contact with the planar conductive polymer layer, disposed in between the first electrode and the second electrode (Fig 1), wherein the first electrode is planar (Fig 1), and wherein application of an electric potential between the first electrode and the second electrode deforms the planar conductive polymer layer such

that the plat-plate low-profile actuator expands or contracts on the longitudinal direction (Paragraph 5).

Keichi et al. does not disclose expressly that the first electrode comprises at least one link portion extending in the longitudinal direction, wherein the first electrode is disposed such that the plat-plate low-profile actuator is less rigid in the longitudinal direction than a direction orthogonal to the longitudinal direction.

Spangler et al. teaches a flat-plate low-profile actuator in which the first electrode (Fig 6) comprises at least one link portion extending in the longitudinal direction (portions of electrode extending longitudinally across the actuator). The language "wherein the first electrode is disposed such that the plat-plate low-profile actuator is less rigid in the longitudinal direction than a direction orthogonal to the longitudinal direction" is functional language that does not, by itself, provide additional structure. As the combination of Keichi et al. and Spangler et al. discloses each of the claimed structural elements, the structure resulting from that combination would be capable of performing the same functions as the claimed structure.

Wilkie et al. teaches a flat-plate low-profile actuator in which the first electrode (item 30 or 32) comprises at least one link portion (item 34 or 38) extending in the longitudinal direction (Fig 4). The language "wherein the first electrode is disposed such that the plat-plate low-profile actuator is less rigid in the longitudinal direction than a direction orthogonal to the longitudinal direction" is functional language that does not, by itself, provide additional structure. As the combination of Keichi et al. and Wilkie et al. discloses each of the claimed structural elements, the structure resulting from that

combination would be capable of performing the same functions as the claimed structure.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the first electrode of either Spangler et al. or Wilkie et al. with the flat-plate low-profile actuator of Keiichi et al. for the benefit of ensuring proper connection despite the occurrence of cracks (Paragraph 61 of Spangler et al.) or of permitting large in-plane actuation strains (column 1, lines 28-30 of Wilkie et al.).

14. With respect to claim 31, the combination of Keichi et al. and either Spangler et al. or Wilkie et al. discloses the flat-plate low-profile actuator as claimed in claim 16. The language "wherein the first electrode is disposed such that the plat-plate low-profile actuator is less rigid in the longitudinal direction than a direction orthogonal to the longitudinal direction" is functional language that does not, by itself, provide additional structure. As the combination of Keichi et al. and either Spangler et al. or Wilkie et al. discloses each of the claimed structural elements, the structure resulting from either of these combinations would be capable of performing the same functions as the claimed structure.

15. With respect to claim 34, the combination of Keichi et al. and either Spangler et al. or Wilkie et al. discloses the flat-plate low-profile actuator as claimed in claim 16. Both Spangler et al. and Wilkie et al. disclose that the first electrode is a linear electrode (Fig 6 of Spangler et al., and Fig 4 of Wilkie et al.). The electrodes of Spangler et al. and Wilkie et al. are linear, as they are made up of linear segments.

16. With respect to claim 35, the combination of Keichi et al. and either Spangler et al. or Wilkie et al. discloses the flat-plate low-profile actuator as claimed in claim 16. Both Spangler et al. and Wilkie et al. disclose that the first electrode comprises a plurality of interconnected linear electrode elements (Fig 6 of Spangler et al., and Fig 4 of Wilkie et al.).

17. With respect to claim 36, the combination of Keichi et al. and either Spangler et al. or Wilkie et al. discloses the flat-plate low-profile actuator as claimed in claim 26. Both Spangler et al. and Wilkie et al. disclose that the first electrode comprises a plurality of interconnected linear electrode elements (Fig 6 of Spangler et al., and Fig 4 of Wilkie et al.).

18. With respect to claim 37, the combination of Keichi et al. and either Spangler et al. or Wilkie et al. discloses the flat-plate low-profile actuator as claimed in claim 26. Keichi discloses that the first electrode is a thin plate (Fig 1). The language "having been subjected to a surface treatment" is product-by-process language that does not, by itself, provide additional structure. It has been held that if the claimed product is the same as or obvious over a product of the prior art, the claim is unpatentable even if the product of the prior art is made by a different process (*In re Thorpe*, 227 USPQ 964). Keichi et al. also discloses that the first electrode is a thin plate comprising a substance selected from a group consisting of carbon, gold, platinum, nickel, titanium, stainless steel, an alloy of gold, an alloy of platinum, an alloy of nickel, an alloy of titanium, and an alloy of stainless steel (Paragraph 26).

19. With respect to claim 38, the combination of Keichi et al. and either Spangler et al. or Wilkie et al. discloses the flat-plate low-profile actuator as claimed in claim 26. Keiichi et al. discloses that the planar conductive polymer layer is composed of a pi-conjugated polymer layer with a substrate comprising a substance selected from a group consisting of ploy aniline, polypyrrole, polythiophene, a carbon dispersion conductive polymer, and an organic conductive polymer which is a derivative of polyaniline, polypyrrole, or polythiophene (Paragraph 14).

20. With respect to claim 39, the claim elements thereof correspond to those of claim 26; therefore, claim 39 is unpatentable over Keichi et al. in view of either Spangler et al. or Wilkie et al. for the same reasons as above.

21. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keichi et al., either Wilkie et al. or Spangler et al., and Kaneko et al. (US 4651310).

22. With respect to claim 19, the combination of Keichi and either Spangler et al. or Wilkie et al. discloses the flat-plate low-profile actuator as claimed in claim 16.

None of Keichi et al., Spangler et al., or Wilkie et al. discloses expressly planar extension portions disposed on two sides of the first electrode in the longitudinal direction, the planar extension portions being operable to transfer a force generated in the plat-plate low-profile actuator.

Kaneko et al. teaches a flat-plate low-profile piezoelectric actuator that includes planar extension portions (portions of film 4 that extend outside of the piezoelectric members 1 and 1') disposed on two sides of the first electrode in the longitudinal

direction (Fig 14), the planar extension portions being operable to transfer a force generated in the plat-plate low-profile actuator (Fig 14).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the extension portions of Kaneko et al. with the flat-plate low-profile actuator of Keichi et al. as modified by either Spangler et al. or Wilkie et al. for the benefit of being able to provide the driving force at a distance from the actuator itself.

23. With respect to claim 20, the combination of Keichi et al., either Spangler et al. or Wilkie et al., and Kaneko et al. discloses the flat-plate low-profile actuator as claimed in claim 19. Kaneko et al. discloses that the planar conductive polymer layer (items 1 and 1') is disposed on front and back sides of the first electrode (Fig 14), and a hole (item 10) is disposed in each of the extension portions so as to link the front and back planar conductive polymer layers for reinforcement (Fig 14).

24. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keichi et al., either Wilkie et al. or Spangler et al., and Couvillon (US 2005/0027198).

25. With respect to claim 24, the combination of Keichi and either Spangler et al. or Wilkie et al. discloses the flat-plate low-profile actuator as claimed in claim 16.

None of Keiichi et al., Spangler et al., or Wilkie et al. discloses expressly that the electrolyte layer is a polymer gel or a polymer containing an ionic fluid.

Couvillon, Jr. teaches a flat-plate low-profile actuator in which e electrolyte layer is a polymer gel or a polymer containing an ionic fluid (Paragraph 43).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the polymer gel of Couvillon, Jr. and the flat-plate low-profile actuator of Keiichi et al. as modified by either Spangler et al. or Wilkie et al. as it has been held that the selection of a material based on its suitability for its intended use is obvious (*In re Leshin*, 125 USPQ 416).

Allowable Subject Matter

26. Claims 17, 32, and 33 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

27. The following is a statement of reasons for the indication of allowable subject matter. The prior art does not disclose or suggest "wherein the first electrode is a zigzag-shaped planar electrode" in combination with the reaming claim elements of claim 17. The prior art does not disclose or suggest "wherein the planar conductive polymer layer has a first side extending in the longitudinal direction and a second side extending in the longitudinal direction; wherein the at least one band-like portion is a plurality of band-like portions, wherein the at least one link portion is a plurality of link portions, wherein the plurality of link portions connect adjacent band-like portions, and wherein the plurality of link portions alternate between being disposed on the first side and the second side such that the band like portions and the link portions cumulatively form a zigzag pattern" I combination with the remaining claim elements of claims 32 and 33.

Response to Arguments

28. Applicant's arguments, see amendments/arguments, filed 21 November 2008, with respect to the drawings have been fully considered and are persuasive. The objections to the drawings have been withdrawn.

29. Applicant's arguments with respect to claims 16, 18-26, 31, and 34-39 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

30. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek J. Rosenau whose telephone number is (571) 272-8932. The examiner can normally be reached on Monday thru Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leung Quyen can be reached on (571) 272-8188. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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